

S P E C I F I C A T I O N

BE IT KNOWN that I, Gill Broom, a citizen of the United States of America, have
invented a new and useful--

**METHOD AND APPARATUS FOR CLEANING
AND FORMING WINDSHIELD WIPER BLADES**

of which the following is the specification.

DESCRIPTIVE TITLE OF THE INVENTION

Method and Apparatus for Cleaning and Forming Windshield Wiper Blades

BACKGROUND OF THE INVENTION

1. Technical Field

[001] The present invention relates generally to the refurbishment of windshield wiper blades and, more particularly, concerns an improved method and apparatus for cleaning deposits from windshield wiper blades and forming the wiper blades to the exact contour of a windshield so that the blades more effectively remove water or any other substance from the windshield.

2. Background Information

[002] Windshield wipers are critical to the safety of the driver of a vehicle. By removing water, dirt, bugs and other matter from the outside surface of a windshield, windshield wipers ensure that the driver maintains good visibility when driving.

[003] However, dirt, bugs and other matter can accumulate on a windshield wiper blade and impair the effectiveness of the blade. Matter on the blade can lead to streaking when the windshield wiper is used and, in some cases, scratching of the windshield. In addition, if significant deposits of matter are allowed to accumulate on the windshield wiper blade, the matter may deform the flexible wiping surface and prevent uniform contact of the blade with the windshield along the length of the blade. As a result, portions of windshield will not be wiped clean when the windshield wiper is used. It is therefore desirable to periodically clean all foreign matter from a windshield wiper blade.

[004] In addition, hardened matter on a windshield may cause nicks and cuts in a windshield wiper blade when the wiper is used. Although the hardened matter may be cleaned and removed from the windshield, any damage to the windshield wiper blade remains, decreasing its effectiveness. Direct sunlight and hot weather may also damage a windshield wiper blade. Any nicks or cuts in the blade will leave a noticeable and irritating streak when the windshield wiper is used.

[005] Several solutions have been recognized for addressing the problem of dirty and damaged windshield wiper blades. First, the windshield wiper blade may simply be replaced. This solution, however, is expensive and the replacement of windshield wiper blades is a chore. This solution is also wasteful because entirely new blades must be purchased even though only a portion of the blade is damaged.

[006] Devices for cleaning and refurbishing windshield blades have also been developed and patented. These devices, such as U.S. Patent No. 5,860,182 issued to Sareyani, U.S. Patent No. 4,617,765 issued to Weiler and U.S. Patent No. 5,426,895 issued to Siciliano, provide a channel containing an abrasive surface into which a dirty or damaged wiper blade is placed. The device is then moved along the length of the blade to scrape and dislodge foreign matter from the blade or, if enough force is exerted on the blade, to remove blade material and eliminate the presence of voids, nicks and cuts.

[007] These devices, however, suffer many disadvantages. First, they must be

manually operated. Second, if not properly operated, these devices can actually cause problems with and ruin a wiper blade. If portions of a wiper blade are ground down more than other portions due to an inconsistent application of force when using the device, these portions of the blade may not contact the windshield when the wiper is used, causing streaking. This problem can only be solved by grinding down the higher portions of the blade. If these portions are ground too far, however, the rest of the blade must be ground down to match, and so on. Perhaps because of these inherent problems, consumers have not embraced the task of cleaning and grinding their own windshield wipers by hand, at least not on a widespread scale.

[008] In addition, these devices are not inexpensive. When considering the expense of purchasing a handheld wiper refurbisher and the trouble and risk of operating it, a reasonable consumer with no other option might instead opt to simply purchase new windshield wiper blades.

BRIEF SUMMARY OF THE INVENTION

[009] The present invention cleans and refurbishes windshield wiper blades by providing an adhesive backed abrasive surface that may be adhered directly to a windshield across the path followed by the windshield wiper. When the windshield wiper is operated with the adhesive backed abrasive surface in place, the wiper is thereby repeatedly dragged across the abrasive surface to clean and refurbish the blade. After the blade is sufficiently cleaned and refurbished, the

inexpensive adhesive backed abrasive surface is removed from the windshield and discarded.

[010] The wiper cleaning technology disclosed herein thereby provides an elegant, inexpensive solution to cleaning and refurbishing windshield wiper blades. The cleaning/refurbishing procedure can be accomplished by any automobile owner without removing the windshield wiper blade from its holder. The procedure uniformly refurbishes a windshield wiper blade, removing all nicks and cuts in the blade, grinding the blade to exactly match the contour of the specific automobile's windshield and removing any hardened rubber on the tip of the blade.

[011] These and other advantages will become apparent as this specification is read in conjunction with the accompanying drawings and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[012] FIG. 1 is a close up view of a windshield washer blade in need of the present invention.

[013] FIG. 2 is an elevational view of a windshield with the device of the present invention installed and prepared to clean and refurbish one of the windshield wiper blades.

DETAILED DESCRIPTION

[014] Figure 1 shows a close up view of a wiper blade **10** having an edge **14** against a windshield **12**. The wiper blade **10** is used to clean the windshield **12** by

moving the edge 14 of the wiper blade across the surface of the windshield. The wiper blade 10 is moved by a holder 16 which motivates the blade across the windshield 12 and also provides a force that pushes the edge 14 of the wiper blade against the windshield 12. It is desirable to keep the edge 14 of the wiper blade 10 against the windshield 12 so that water is pushed in front of the blade as it is moved across the windshield and the windshield is cleared of water and cleaned of any dirt or foreign matter. If any portion of the edge 14 of the wiper blade 10 loses contact with the windshield 12 during operation, a streak 18 will develop on the windshield.

[015] A streak 18 on the windshield may be caused by a particle 20 that becomes stuck on the edge 14 of the wiper blade 10. The particle 20 causes the edge 14 of the wiper blade 10 to deform so that it is not in consistent contact with the windshield 12 during operation. This deformation creates a gap 21 between the edge 14 of the wiper blade 10 that causes a streak 18 across the windshield when the wiper blade is operated. This streak 18 cannot be removed from the windshield 12 by the wiper blade 10 until the particle 20 is cleaned from the edge 14 of the wiper blade 10 to eliminate the gap 21.

Streaks 19 can also be formed on the windshield 12 by voids 22 in the edge 14 of the wiper blade 10. These voids 22 may be caused by hardened foreign matter on the windshield that rips or tears the edge 14 of the wiper blade 10, or simply by general wear of the edge of the wiper blade. These voids 22 may be removed by

grinding the edge **14** of the wiper blade **10** down to the dotted line **24** shown in FIG. 1 as explained below.

[016] The gaps **21** and voids **22** on the edge **14** of the wiper blade **10** may be removed by the present invention, an adhesive backed abrasive strip **28** with an abrasive surface and an adhesive back.

[017] The adhesive backed abrasive strip **28** may be a rectangular strip of adhesive backed sandpaper one half inch wide and eight to twenty-five inches long, depending on the length of the wiper blades to be cleaned and refurbished. However, longer strips are also contemplated for use with larger commercial vehicles such as trucks and buses. The present invention may also be distributed in a roll. If this embodiment of the invention is used, the adhesive back abrasive strip may be sold in extended lengths so that the user may tear or cut only as much of the product as is needed for a particular windshield wiper.

[018] The abrasive surface of the adhesive backed abrasive strip **28** is preferably 260 grit sandpaper as is commonly known and available. Although other grades of sandpaper may be used with the present invention, 260 grit sandpaper has been found to be effective. Other abrasive materials other than conventional sandpaper are also contemplated and would be within the scope of the present invention.

[019] The adhesive backing on the abrasive strip **28** may be any type of bonding agent. In one implementation, the bonding agent is an adhesive capable of securely but temporarily affixing the strip to windshield glass, while also allowing

for easy removal without leaving residue on the windshield glass **12**. In another implementation, the adhesive backing could also be a flexible film with a strong surface adhesion to glass that nonetheless may be easily peeled from the glass.

[020] As shown in Fig. 2, a windshield wiper blade **11** may be cleaned and refurbished by the adhesive backed abrasive strip **28** of the present invention by temporarily affixing the strip to a windshield **12** as shown in FIG. 2. The abrasive strip **28** is placed across the path of the wiper blade **11** represented by the dotted lines **30** with the adhesive side of the strip against the windshield glass **12**. The abrasive strip **28** is placed approximately midway in the arc of the path followed by the wiper blade **11**. Although the abrasive strip **28** may be placed in any position across the path of the wiper blade **11**, a position approximately midway in the arc of the path has been found to provide effective cleaning and refurbishing of most wiper blades. The abrasive strip **28** is placed so that the ends **29** of the strip extend at least approximately one inch past the edge of the path followed by the wiper blade **11**.

[021] When the present invention is positioned on the windshield **12** as described, the windshield wiper blade **11** may then be cleaned and refurbished by simply activating the windshield wipers and allowing the windshield wiper blade **11** to pass over the adhesive backed abrasive strip. For example, depending on the wiper blade material, the wiper blade may be allowed to pass over the cleaning strip ten to twelve times. After this number of passes over the abrasive strip **28**, it

has been found that, in most cases, the windshield wiper blade 11 has been sufficiently cleaned and refurbished. The abrasive strip may also refurbish severe or particularly deep cuts if the operator allows the wiper blade additional passes over the abrasive strip.

[022] After wiper blade 11 is sufficiently cleaned and refurbished, the abrasive strip 29 is removed from the windshield 12 and discarded. The wiper blade 13 may be similarly cleaned and refurbished by placing another abrasive strip in the path of that blade.

[023] The present invention as described is inexpensive and is discarded after a single use on a single wiper blade. The present invention is easy to use with the only attention required being the need to place the adhesive backed strip in a position across the path of the wiper blade so that the wiper blade contacts the strip when it is passed over the strip. Otherwise, operation of the present invention is automated and accomplished by the mechanical operation of the wiper blades without having to remove a wiper blade from its installed position on an automobile. This automation leads to consistent and predictable results, unlike prior art methods for cleaning and refurbishing worn wiper blades.

[024] The present invention also provides the advantage of forming the wiper blade to exactly match the contour of the windshield of the specific vehicle on which it is used. Even new wiper blades can benefit from this treatment and will provide superior performance if the present invention is used immediately

following installation of a new wiper blade.

[025] Many alterations, variations, and combinations are possible that fall within the scope of the present invention. Although the preferred embodiments of the present invention have been described, those skilled in the art will recognize other modifications that may be made that would nonetheless fall within the scope of the present invention. Therefore, the present invention should not be limited to the apparatus and method described. Instead, the scope of the present invention should be consistent with the invention claimed below.